

# Revisiting Appropriate Use Principles for Transthoracic Echocardiography in the COVID-19 Pandemic Era



## Keywords

Transthoracic echocardiography • COVID-19 • Appropriate use • Triage

To the Editor,

In light of the current novel coronavirus (COVID-19) pandemic, we would like to highlight the importance of the need to triage transthoracic echocardiography (TTE) requests appropriately. Although the Cardiac Society of Australia and New Zealand (CSANZ) Imaging Council has released a position statement for echocardiography during COVID-19 [1], the escalating current COVID-19 outbreak threatens to overload our health service infrastructure and necessitates the allocation of scarce medical resources to prioritise our most vulnerable groups while protecting our workforce.

In 2011, the American Society of Echocardiography (ASE) developed the Appropriate Use Criteria (AUC) [2]. These are a comprehensive set of criteria featuring 202 items aimed at providing guidance to referring clinicians in order to reduce the misuse of TTE, a modality of imaging particularly prone to over-ordering given its lower risk profile. However, in the fast-paced and high-volume cardiology setting, the more comprehensive AUC may not be entirely practical or time-efficient.

Fonseca and colleagues [3] created a point-of-service questionnaire (PSQ) based on four binary questions:

- 1) Was the scan requested in the absence of new cardiovascular symptoms/change in clinical status or cardiac examination?
- 2) Is this a routine surveillance scan?
- 3) Has there been a previous TTE within the last year?
- 4) Is the test requested for suspected endocarditis with no positive blood cultures or new murmur?

We externally validated the PSQ against the AUC at a single-centre cardiology department at a tertiary hospital in Sydney, Australia over a period of 6 weeks during the first COVID wave [4]. One hundred and eighty-one (181) TTE requests were assessed via either tool, and as compared to

the AUC, the PSQ was determined to have 96% sensitivity and 85% specificity, and concordance (Cohen's kappa value of 0.83). Importantly, TTE requests were triaged in less than half the time using the PSQ (13 s) than the AUC (35 s). We confirmed similar major adverse cardiovascular events between the two tools.

Ultimately, in unprecedented times such as the COVID-19 pandemic, it is prudent to limit unnecessary and non-urgent investigations. In addition to the principles outlined in the CSANZ Position Statement, we propose the PSQ can be a practical option for clinicians to triage transthoracic echocardiogram requests, given its utility, safety and time-efficiency. Our viewpoint aligns with the current recommendations by the CSANZ [1] and ASE [5] to carefully evaluate provision of echocardiographic services, especially due to the increased risk of viral transmission to health care workers [5]. Furthermore, given its value, the PSQ may also be extrapolated to other resource-limited settings where access to echocardiography is limited.

## Declarations of Interest

None.

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## References

- [1] Wahi S, Thomas L, Stanton T, Taylor A, Mahadevan D, Evans G, et al. CSANZ imaging Council position statement on echocardiography services during the COVID-19 pandemic. *Heart Lung Circ.* 2020;29(6):e78–83.
- [2] Douglas PS, Garcia MJ, Haines DE, Lai WW, Manning WJ, Patel AR, et al. Appropriate use criteria for echocardiography: a report of the ACCF appropriate use criteria Task Force, ASE, AHA, ASNC. *J Am Coll Cardiol.* 2011;57:1126–66.
- [3] Fonseca R, Pathan F, Marwick TH. Development and validation of a screening tool for the identification of inappropriate transthoracic echocardiograms. *BMJ Open.* 2016;6:e012702.
- [4] Madan K, Khor L, Pathan F, Negishi K. Transthoracic echocardiography in the COVID-19 pandemic era – an external validation of a point of service questionnaire (PSQ) as a triaging tool. *J Am Coll Cardiol.* 2021;77(18\_Supplement\_1):3151.
- [5] Kirkpatrick JN, Mitchell C, Taub C, Kort S, Hung J, Swaminathan M. ASE statement on protection of patients and echocardiography service providers during the 2019 novel coronavirus outbreak: endorsed by the ACC. *J Am Soc Echocardiogr.* 2020;33(6):648–53.